CONDITION MONITORING ON SURGE ARRESTER USING IMPROVISED METAL OXIDE SURGE ARRESTER INTELLIGENT MONITORING SYSTEM

HARIBALAN A/L RAMANATAN

A project report submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Engineering (Electrical - Power)

Faculty of Electrical Engineering
Universiti Teknologi Malaysia

JUNE 2014

Specially dedicated to my dearest wife, Varshalaxmi Bhatt, family and friends who have encouraged, guided and inspired me throughout my journey of education.

ACKNOWLEDGEMENT

I would like to express my many thanks to my supervisor of this project, Dr. Zulkurnain Abdul-Malek for the inspiration and guidance in this project. He has constantly provided valuable guidance and advice which has motivated me to contribute my fullest to this project. In addition, gratitude is dedicated to my wife and close friends who has been all the way tolerating and helping me in providing moral and technical support during the course of this project. Their constant support has greatly motivated me to continuously put in effort towards the completion of this project.

ABSTRACT

A tool for condition monitoring for Metal Oxide Surge Arrester (MOSA) has been developed in Labview. The software (MOSAIMS) runs in Microsoft Windows operating system and features a user friendly graphic interface. The condition of the MOSA can be monitored by analyzing the leakage current from the arrester. The leakage current contains third harmonic component which varies as the MOSA degrades. The leakage current need to go through Fast Fourier Transform (FFT) to extract the third harmonic component from the leakage current. The third harmonic component is the most important parameter as it directly reflects the condition of the MOSA. Improvised MOSAIMS program was developed in such a way that it is compatible with Windows 8 and touch screen functions.

ABSTRAK

Satu perisian untuk memantau keadaan Metal Oxide Surge Penangkap (MOSA) dibangunkan di LabVIEW 2011. Perisian (MOSAIMS) berjalan dalam sistem operasi Microsoft Windows dan ciri-ciri antara muka mesra pengguna grafik. Keadaan MOSA boleh dipantau dengan menganalisis arus bocor dari penangkap. Arus bocor mengandungi komponen harmonik yang berbeza-beza mengikut MOSA mempersendakan. Arus bocor perlu melalui Fourier pantas (FFT) untuk mengeluarkan komponen harmonik daripada arus bocor. Komponen harmonik ke-3 adalah parameter yang paling penting kerana ia secara langsung mencerminkan keadaan MOSA. Program MOSAIMS spontan telah dibangunkan dengan cara yang serasi dengan Windows 8 dan fungsi skrin sentuh diaktifkan supaya ia akan menjadi lebih mesra pengguna.